EXPRESSION OF ESAM AND vWF AS ANGIOGENESIS MARKER IN TUMOR GROWTH AND METASTASIS OF CARCINOMA MAMMAE

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BACKGROUND

- **Breast cancer is a common malignant tumor and the major cause of cancer death among women globally including in Indonesia.**
- **It is estimated that about 12% of women will develop breast cancer in their lifetime (Jemal, 2011).**
- **Several factors play a predominant role in the development and progression of breast cancer.**

BACKGROUND

- **Angiogenesis is a fundamental process required for a number of physiologic and pathologic events.**
- **Under pathologic conditions, angiogenesis plays an important role in tumor growth, invasion, and metastasis .**
- **The angiogenic process includes endothelial cell activation, proliferation, migration, tube formation and capillary sprouting.**

BACKGROUND

- **Endothelial cell-Selective Adhesion Molecule (ESAM) is a member of the immunoglobulin like superfamily protein in tight junction and mediates homophilic interaction of endothelial cells.** (Hirata: 2001)
- **ESAM plays a role in primary tumor growth and metastases in mice model through angiogenesis process.** (Ishida: 2003 & Cangara: 2010)
- **Von Willebrand Factor (vWF) is a multimeric glyprotein that mediates platelet adhesion to subendothelial matrix and endothelial surfaces.** (Huang: 2009)
- **vWF is synthesized by endothelial cells, where it can be released into the circulation or stored within Weibel-Palade bodies (WPBs), till be released upon stimulation**. (Sporn: 1986)

OBJECTIVES

- **The aims of this study were to evaluate and investigate immunohistochemically expression of ESAM in correlation with histopathologic differentiation and to compare with vWF expression in breast cancer.**

METHODS

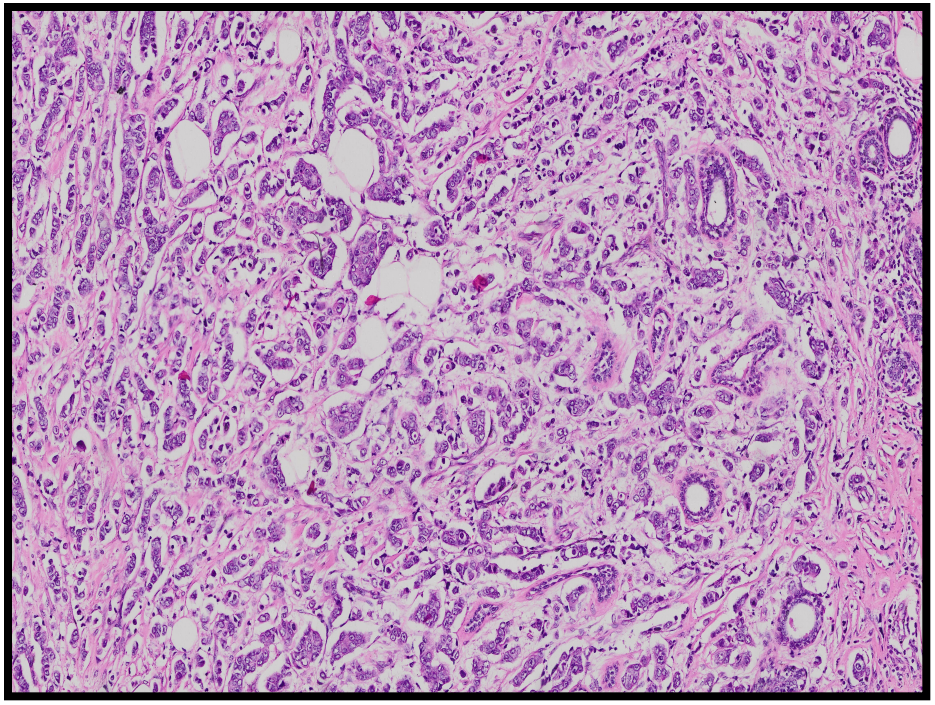
- **This study was performed at anatomical pathology laboratory, Faculty of Medicine, Hasanuddin University.**
- **79 tissue samples of invasive ductal carcinoma mammae were stained immunohistochemically with ESAM, vWF and Ki-67 antibodies to evaluate its vascularity and cell proliferation.**
- **Statistical analysis was determined by t-test of One way analysis of variance (ANOVA).**

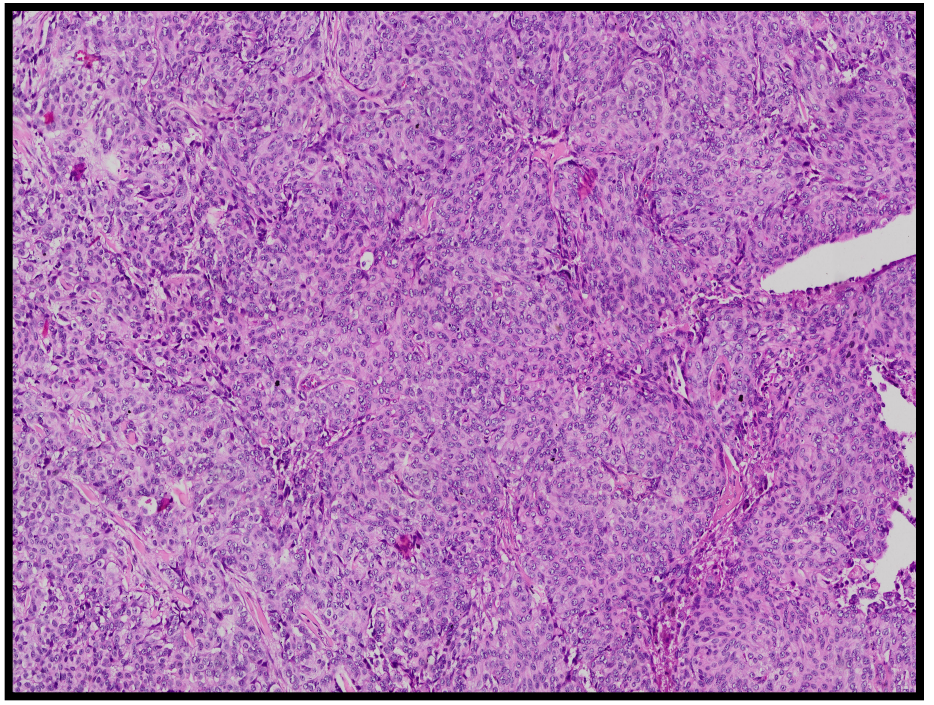
RESULTS

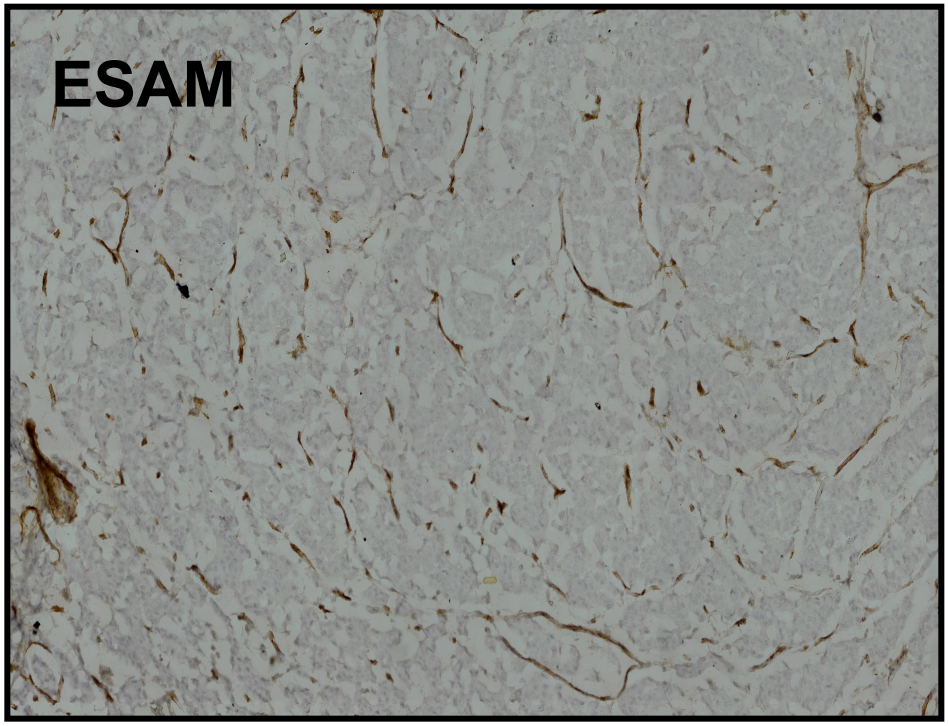
TABLE 1
CHARACTERISTICS OF SAMPLES

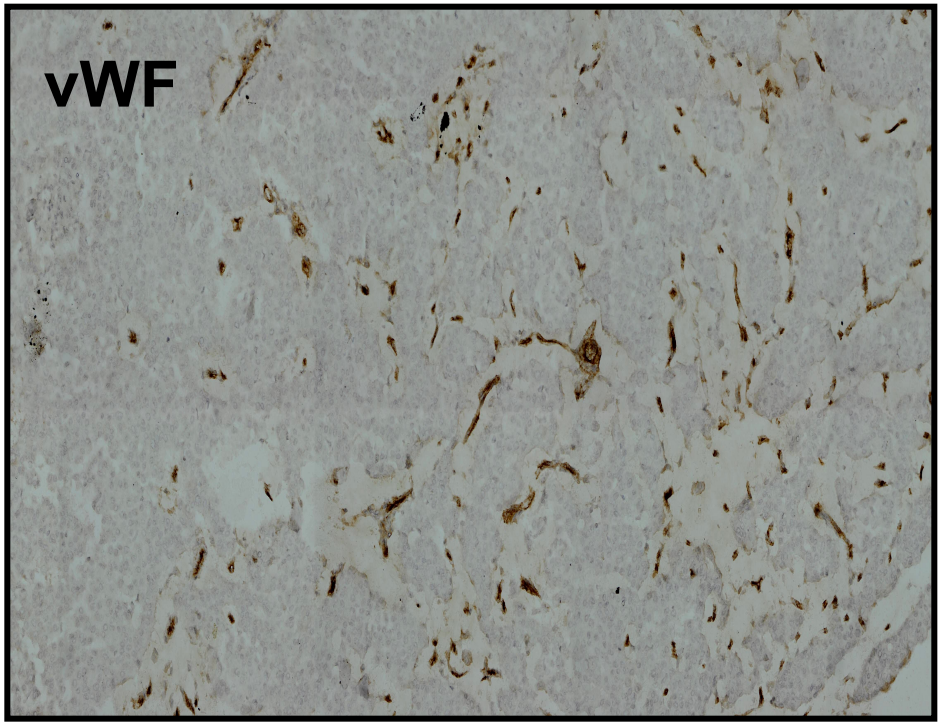
CHARACTERISTICS	NUMBER = 79 (%)
SEX :	
Male	3 (4)
Female	76 (96)
AGES (Y.O.) :	
Less than 31	5 (7)
31 - 40	20 (25)
41 - 50	20 (25)
51 - 60	23 (29)
More than 61	11 (14)
TUMOR VOLUME (CM3)	
Less than 50	33 (41)
51 - 400	38 (48)
More than 400	8 (11)
DIFFERENTIATION	
Well	11 (15)
Moderate	47 (59)
Poor	21 (26)
METASTASES	
Positive	12 (16)
Negative	67 (84)

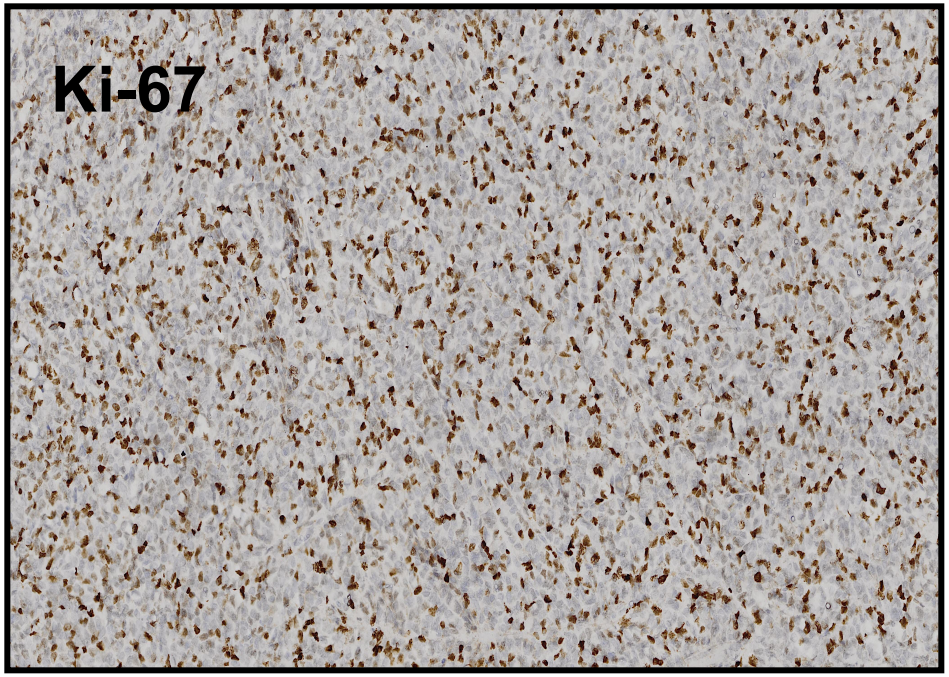

STAINLESS











EXPRESSION OF ESAM, vWF and KI-67 IN INVASIF DUCTAL CA. MAMMAE

RESULTS

TABLE 2
CORRELATION OF VASCULAR NUMBER (ESAM & vWF EXPRESSION) WITH CHARACTERISTICS OF SAMPLES

CHARACTERISTICS	VASCULAR NUMBER (ESAM)		VASCULAR NUMBER (vWF)	
	LOW (n = 31)	HIGH (n = 48)	LOW (n = 34)	HIGH (n = 45)
TUMOR VOLUME (cm3)				
Les than 50	**21 (64%)** *	12 (36%)	**23 (69%)** *	10 (31%)
51 - 400	8 (21%)	**30 (79%)** *	9 (29%)	**27 (71%)** *
More than 400	2 (25%)	**6 (75%)** *	2 (25%)	**8 (75%)** *
DIFFERENTIATION				
Well	4 (36%)	7 (64%)	6 (54%)	5 (46%)
Moderate	20 (42%)	27 (58%)	20 (42%)	27 (58%)
Poor	7 (33%)	14 (67%)	8 (38%)	13 (62%)
METASTASES				
Positive	0 (0%)	**12 (100%)** *	7 (58%)	5 (42%)
Negative	31 (46%)	36 (54%)	27 (40%)	40 (60%)

***p ≤ 0.05, Low vs High ; Average of vascular number (ESAM) = 62; (vWF) = 58**

RESULTS

TABLE 3

CORRELATION OF Ki-67 EXPRESSION WITH CHARACTERISTICS OF SAMPLES

CHARACTERISTICS	AVERAGE NUMBER OF KI-67 - EXPRESSED CELLS
TUMOR VOLUME (cm3)	
Less than 50	**24.91** $ #
51 - 400	**159** @
More than 400	**424**
DIFFERENTIATION	
Well	188.1
Moderate	127.6
Poor	186.7
METASTASES	
Positive	182
Negative	136

$p \leq 0.05$ @more than 400 vs 51-400; $ vs less than 50; # 51-400 vs less than 50

RESULTS

TABLE 4
CORRELATION OF VASCULAR NUMBER (ESAM EXPRESSION) WITH Ki-67 EXPRESSION

CHARACTERISTICS	AVERAGE NUMBER OF KI-67 - EXPRESSED CELLS
VASCULAR NUMBER	
Low Vascular Density	89.3 @
High Vascular Density	194.04

@ p ≤ 0.05, Low vascular density vs High vascular density

RESULTS

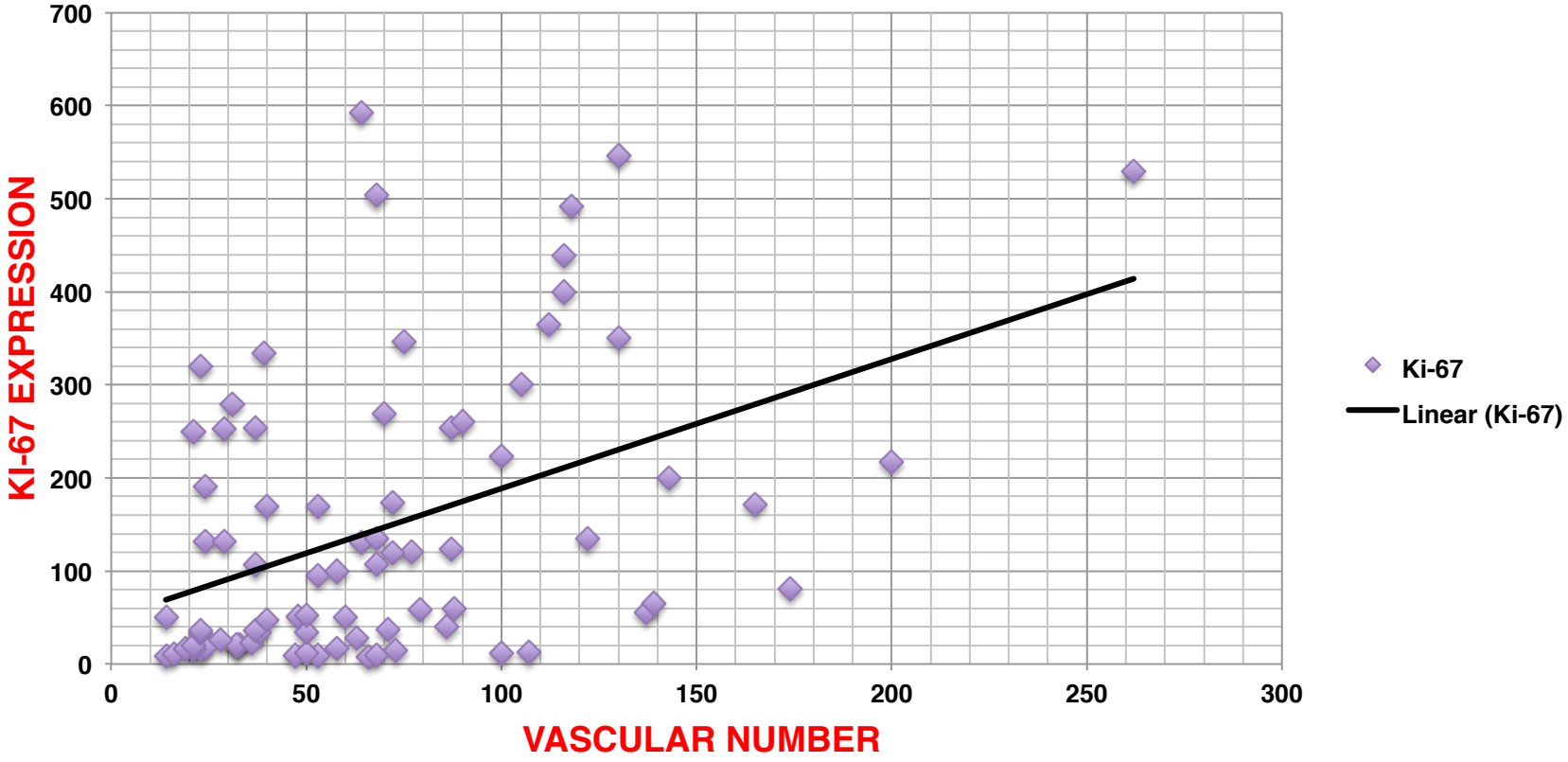


FIGURE 2

CORRELATION OF VASCULAR NUMBER OF TUMOR (ESAM EXPRESSION) WITH Ki-67-EXPRESSED CELLS IN INVASIVE DUCTAL CARCINOMA MAMMAE

SUMMARY

- **There was a correlation between the size of tumor mass and the number of vascularization (ESAM & vWF expression) in which the larger tumor mass, more vascularization they have**
- **The size of tumor mass is associated with increased expression of Ki-67 in tumors with high vascular density**
- **There is a relationship between the number of tumor vascularization by the presence or absence of metastases**

CONCLUSION

- **Angiogenesis plays an important role in tumor growth through an increasing number of vascular tissues and tumor cell proliferation activity**
- **ESAM and vWF as the endothelial cell expressed proteins play a role in the angiogenesis process of breast cancer**
- **Angiogenesis also plays a role in the metastatic process, which ESAM expression is more consistent than vWF in predicting the presence or absence of metastatic of breast cancer**

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- All the authors declare no conflict of interest